again falling on the third, and so on, the accumulation of falling matter would be such from floor to floor, that after the failure of the upper floor, that in which the arch was under repair, the whole would appear to fall almost instantaneously, or in one great crash."

They therefore regard the failure of the arch in the upper floor, for which no apparent reason is assigned, as the primary cause of the accident.

The commissioners made inquiries into "the state of chemical knowledge connected with cast-iron generally," and are disposed to consider it imperfect.

"While referring to these and other researches on a subject becoming daily of more importance to the public, we abstain from all remark as to the forms which may at present appear best adapted for cast-iron beams, further than to observe that when calculations as to the strength of such beams are founded on the supposition that the cast-iron employed is of uniform texture, it would appear difficult to obtain this homogeneity except in castings of nearly uniform thickness in the various parts; that when cast-iron beams are suddenly removed red-hot from the sand in which they are cast, we should expect them to be comparatively brittle, however good the iron may otherwise be; and that some efficient proof of cast-iron beams is most desirable before they are employed in buildings, since, assuming effective forms and the use of good iron, every care having been taken to cool them properly, flaws may exist, not visible externally, rendering them unfit to support the weights they are intended to sustain."

"While on the subject of cast-iron for beams, we would state our strong conviction, founded on a general view of the subject, of the importance of substituting wrought-iron for cast-iron, whenever it can be accomplished, and we anticipate that wrought-iron will be rolled into a sufficient size for all the uses to which large cast-iron beams are now applied, judging from the present size of rolled pieces of iron. When this shall have been accomplished, a great advance will have been made in the use of iron, seeing that beams, or other large pieces of that metal may, with confidence, be relied upon. We consider that when wrought-iron can be thus rolled and employed, its use will become most extensive, and that the consumption of iron for building purposes would be greatly increased, to the benefit of an important branch of our national industry."

They urge with great propriety that experiments respecting the best and strongest forms of wrought and cast-iron beams and columns should be conducted by officers of the Royal Engineers, at Woolwich, or elsewhere, anticipating that such experiments would be of great public importance, by leading to highly beneficial and practical results, the more beneficial in proportion as a knowledge of them could be disseminated by publications of a moderate price.

At the close of the joint report Mr. Cubitt has introduced some remarks and suggestions which are so important, that we are induced to transfer them entire to our pages.

"And I would further humbly represent to your Majesty, that since the first introduction of iron into buildings, its use has progressively increased; and considering that it is desirable to encourage the erection of buildings that are composed of incombustible materials, affected as little as possible by the changes of weather from dryness to humidity, and free from the effects of dry rot, or the ravages of vermin, and cast-iron at present being one of the principal materials by which these advantages are conveniently secured, there is, it must not be disguised, great danger to be apprehended in its use in consequence of our limited and imperfect knowledge of its qualities and properties.

Buildings constructed with floors of wood, though at the mercy of an incendiary, and subject to many inconveniences, have at least this one advantage, namely, that an injudicious application of it in their construction is to be less dreaded than when cast-iron is the substance employed.

Wood being much more elastic receives, without injury, shocks which would be fatal to cast-iron; while its great flexibility adapts it to give warning of its own insufficiency, or of an undue pressure acting upon it, perhaps in time to avert danger; whereas cast-iron, from its nature, is incapable of affording the like demonstration of its weakness; and the fall of a building so constructed, from the weight and solidity of the material, is likely to be attended with far more disastrous consequences.

Yet, notwithstanding the many casualties to which cast-iron is liable, its introduction into buildings has been a great gain; and I believe that fewer accidents have happened, with all its disadvantages, than might have been reasonably expected. And buildings very essential to the safety of the inhabitants of thickly-peopled towns, affording security against the devastations of fire, either by diminishing the risk of its first outbreak, or cutting off the communication with the adjacent burning houses, in order to stop the progress of the flames, could not be constructed conveniently, adapted to the purposes of trade or for public rooms, without the use of iron.

The erection, then, of such buildings being of the utmost importance to all classes of the community, and our knowledge of the best forms and arrangements of cast-iron beams not being based upon principles the correctness of which cannot be questioned, I do feel that any attempt by legislative enactment to control the erection of this kind of buildings might prove vexatious in its operation, from the difficulty there would be (in the absence of acknowledged correct data on which to found comprehensive rules for the regulation of such buildings, and amidst the conflicting opinions of persons who have thought much on the subject), in selecting proper persons to whom authority might be given, who would have sufficient practical knowledge to ensure their decisions being always satisfactory, or who would consider the subject sufficiently alike to secure a uniform practice in the different districts, without which uniformity persons might be called upon to vary their manner of building, if it happened to be in another district, according to the notions of the surveyor of each. If they were too severe, it would retard the erection of buildings intended to be fire-proof while on the other hand a false confidence might be given, that would prevent the careful consideration of the parties principally engaged, owing to their being relieved from responsibility.

It therefore becomes desirable that every possible facility and encouragement should be given to persons to improve and make buildings more safe and durable; and I should regret if any thing were done that might interfere with the use of iron so as to retard its more general introduction, as it appears to me to be a material the use of which it is of the utmost importance in every way to encourage.

Much, however, if not all the risk involved in using iron for beams would be avoided, by the substitution of wrought for cast-iron; but up to the present time, the anxiety for this change is not widely enough diffused to lead to any immediate practical result in the manufacturing of wrought-iron beams of such dimensions as are applicable to buildings of the largest size. And it may be remarked that the larger the building is, there is generally greater danger of failure, with more deplorable results; consequently the more urgent need there is for increased precaution in providing a corresponding amount of strength, the greater are the difficulties at present experienced, at least as regards wrought-iron.

The expenses necessary to the production of large masses of iron, rolled in the form of beams, being more than a private individual might feel himself justified in incurring for his own use, and the demand from an inadequate conception of their value not being sufficiently pressing or extensive to secure the manufacturer from loss, it is to be feared that it will take some time yet before we shall be in possession of the many advantages which it may be expected will result from their manufacture, unless some stimulus be given in order to hasten the attainment of this very desirable object.

I therefore humbly suggest for the consideration of your Majesty the expediency of devoting 1,000*l.* or 1,500*l.* to this purpose, and would propose that premiums of such sums as it may appear advisable, be offered for the best and strongest rolled iron beams, calculated for the use of floors, to sustain a load not under 25 tons, with bearings not less than 24 feet apart.

And in order to ensure a steady progress in the improvement of the manufacture of iron generally, perhaps an exhibition once a year of the best samples with new forms, will forward the attainment of this end. Such samples might be tested in a proving house, which it may be thought expedient to establish for the accommodation of the public generally, where parties may be allowed to have beams or chains proved at a moderate expense, by which the value of the commodity and its fitness for the proposed work may be ascertained.

The cost of apparatus for proving beams only, being heavy, and requiring much practice in order to make such fully available and to arrive at correct results, it follows that those persons only who are extensively engaged in building, provide themselves with means for testing the strength of iron beams, whilst those whose use of them is occasional have no convenient opportunity of proving them; and it would seem that such persons have greater need of this sort of assistance) than those who, from their extensive practice, become more conversant with the general strength of iron.

I would therefore beg leave to recommend for the consideration of your Majesty's Government, the expediency of providing a proving house, if not in every large town, at least in London, where any persons might send their beams, and rely upon their being correctly tested.

I believe that if facilities were furnished for getting wrought-iron of large dimensions, very few large timbers would be used in building; and as iron can be produced in unlimited quantities, and the whole of the cost of its production spent in employing the labour of this country, the benefit it would produce could hardly be calculated; for, in addition to that required for our own use, an immense demand would grow up for exportation, as it would provide the means of making safe and durable fire-proof buildings — what every person desires, but which at present is very difficult to attain.

Thus the community at large would be benefited by an extended manufacture of wrought-iron, and particularly all the public works under the immediate control of your Majesty's Government. All buildings, whether used as storehouses, barracks, or hospitals, might be rendered more safe and more permanent. Large beams of wrought-iron might be very advantageously employed in ship-building generally, and more especially for supporting the decks over the boilers of steam-vessels. And, to conclude, another step would be taken in order to secure to this nation that pre-eminence it has hitherto maintained in the manufacture of iron.

All which I humbly certify to your Majesty.

THOS. CUBITT.

London, 28th February, 1845."

We have confined ourselves in the present notice to those parts of the report which refer more particularly to the mill at Oldham, and shall return to the subject with reference to the House of Correction at Northleach, and the information to be obtained from the evidence generally.

THE WILTSHIRE TOPOGRAPHICAL SOCIETY.

THE anniversary meeting was held on Saturday last, to receive the report, audit the accounts, and elect a new council.

The second volume of this society's publications will be ready in the course of June; being "A Memoir of John Aubrey, F.R.S., embracing his auto-biographical sketches, a brief review of his personal and literary merits, and an account of his life and works; with extracts from his correspondence, anecdotes of some of his contemporaries, and of the times in which he lived."

For this work, which promises to be one of very great interest, the society are indebted to Mr. Britton, who has devoted to it much time and labour.

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